

**VIRULENCE FACTORS AND ANTIMICROBIAL RESISTANCE PATTERN OF  
BACTERIAL ISOLATES FROM READY-TO-EAT WATERMELONS AND  
PINEAPPLES IN OTA**

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**(19PCQ02046)**

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PINEAPPLES IN OTA**

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE  
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TECHNOOLOGY, COVENANT UNIVERSITY**

**SUPERVISOR: PROF. GRACE I. OLASEHINDE**

**September 2021**

## ACCEPTANCE

This is to attest that this dissertation is accepted in partial fulfillment of the requirements for the award of the degree of Master of Science in Microbiology in the Department of Biological Sciences, College of Science and Technology, Covenant University, Ota, Nigeria.

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### **DECLARATION**

I, **FASUYI, NIFEMI OLAMIDE** (19PCQ02046) declare that this research was carried out by me under the supervision of Prof. Grace I. Olasehinde of the Department of Biological Sciences, College of Science and Technology, Covenant University, Ota, Nigeria. I attest that this dissertation has not been presented either wholly or partially for the award of any degree elsewhere. All sources of data and scholarly information used in this dissertation are duly acknowledged.

.....

**FASUYI, NIFEMI OLAMIDE**

Signature and Date

## CERTIFICATION

We certify that this dissertation titled “Virulence factors and antimicrobial resistance pattern of bacterial isolates from ready-to-eat watermelons and pineapples in Ota” is an original research work carried out by **FASUYI, NIFEMI OLAMIDE (19PCQ02046)** in the department of Biological Sciences, College of Science and Technology, Covenant University, Ota, Ogun state, Nigeria under the supervision of Prof. Grace I. Olasehinde. We have examined and found this work acceptable as part of the requirements for the award of Master of Science (M.Sc) degree in Microbiology.

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## **DEDICATION**

To Ayotomi and Akinyemi

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## TABLE OF CONTENTS

CONTENTS	Page
<a href="#"><u>ACCEPTANCE</u></a> .....	3
<a href="#"><u>DECLARATION</u></a> .....	4
<a href="#"><u>CERTIFICATION</u></a> .....	5
<a href="#"><u>DEDICATION</u></a> .....	6
<a href="#"><u>ACKNOWLEDGEMENTS</u></a> .....	7
<a href="#"><u>TABLE OF CONTENTS</u></a> .....	9
<a href="#"><u>LIST OF FIGURES</u></a> .....	12
<a href="#"><u>LIST OF PLATES</u></a> .....	13
<a href="#"><u>LIST OF TABLES</u></a> .....	14
<a href="#"><u>ABSTRACT</u></a> .....	15
<a href="#"><u>CHAPTER ONE</u></a> .....	16
<a href="#"><u>INTRODUCTION</u></a> .....	16
<a href="#"><u>1.1 Background of the Study</u></a> .....	16
<a href="#"><u>1.2 Statement of the Problem</u></a> .....	2
<a href="#"><u>1.3 Aim of the Study</u></a> .....	3
<a href="#"><u>1.4 Objectives of the Study</u></a> .....	3
<a href="#"><u>1.5 Justification for the Study</u></a> .....	3
<a href="#"><u>1.6 Scope of the Study</u></a> .....	4
<a href="#"><u>CHAPTER TWO</u></a> .....	5
<a href="#"><u>LITERATURE REVIEW</u></a> .....	5
<a href="#"><u>2.1 Introduction</u></a> .....	5
<a href="#"><u>2.2 An Insight to Fruits</u></a> .....	5
<a href="#"><u>2.3 Nutritional Composition of Fruits</u></a> .....	8
<a href="#"><u>2.4 Fruit Production Around the World</u></a> .....	9

<a href="#"><u>2.5 Benefits of Eating Fruits and Vegetables</u></a> .....	250
<a href="#"><u>2.6 Contamination of Fruits</u></a> .....	261
<a href="#"><u>2.7 Foodborne Pathogens and their Diseases</u></a> .....	15
<a href="#"><u>2.8 Overview of Antibiotics</u></a> .....	350
<a href="#"><u>2.9 Virulence Factors</u></a> .....	23
<a href="#"><u>2.10 Current Challenges and Future Perspectives</u></a> .....	27
<a href="#"><u>2.11 Conclusion</u></a> .....	28
<b><a href="#"><u>CHAPTER THREE</u></a></b> .....	29
<b><a href="#"><u>MATERIALS AND METHODS</u></a></b> .....	29
<a href="#"><u>3.1 Sample Location</u></a> .....	29
<a href="#"><u>3.2 Materials</u></a> .....	450
<a href="#"><u>3.3 Methods</u></a> .....	450
<b><a href="#"><u>CHAPTER FOUR</u></a></b> .....	37
<b><a href="#"><u>RESULTS</u></a></b> .....	37
<a href="#"><u>4.1 Bacterial Load of Fruit Samples</u></a> .....	37
<a href="#"><u>4.2 Gram Stain Reaction</u></a> .....	39
<a href="#"><u>4.3 Results of Biochemical Tests</u></a> .....	5641
<a href="#"><u>4.4 Results of Antibiotic Susceptibility Testing</u></a> .....	42
<a href="#"><u>4.4 Virulence Factors Assessment</u></a> .....	45
<a href="#"><u>4.5 Statistical Analysis of Most Active Antibiotics</u></a> .....	48
<b><a href="#"><u>CHAPTER FIVE</u></a></b> .....	58
<b><a href="#"><u>DISCUSSION</u></a></b> .....	58
<b><a href="#"><u>CHAPTER SIX</u></a></b> .....	63
<b><a href="#"><u>CONCLUSION AND RECOMMENDATIONS</u></a></b> .....	63
<a href="#"><u>6.1 Summary</u></a> .....	63
<a href="#"><u>6.2 Conclusion</u></a> .....	63

<a href="#"><u>6.3 Contributions to Knowledge</u></a> .....	63
<a href="#"><u>6.4 Recommendations</u></a> .....	64
<a href="#"><u>REFERENCES</u></a> .....	65
<b>APPENDIX</b> .....	82

## LIST OF FIGURES

Figures	Title of Figures	Page
2.1	Anatomy of a Fruit	6
3.1	Map of Ota	29
4.1	Bar Chart Showing Antibiotic Susceptibility Profile of Bacteria Isolates	45
4.2	Box Plot Showing Most Active Antibiotics Group	48
4.3	Scatter Plot of OFL and Biofilm Formation	49
4.4	Scatter Plot of OFL and Protease Activity	50
4.5	Scatter Plot of OFL and Hemolysis	51
4.6	Scatter Plot of GEN and Biofilm Formation	52
4.7	Scatter Plot of GEN and Protease Activity	53
4.8	Scatter Plot of GEN and Hemolysis	54
4.9	Scatter Plot of ERY and Biofilm Formation	55
4.10	Scatter Plot of ERY and Protease Activity	56
4.11	Scatter Plot of ERY and Hemolysis	57

## LIST OF PLATES

Plates	Title of Plates	Page
2.1	Whole, Cut and Packaged Ready-to-eat Watermelons	7
2.2	Whole Pineapples	8
2.3	Fruit Display Methods in the Market	14
3.1	Yellow and Pink Pigments of Urease Test	31
3.2	Blue and Green Pigments of Citrate Test	32
3.3	Bubble Formation of Catalase Test on Left Slide	32
3.4	Sugar Fermentation	33
4.1	Plates Showing Bacterial Isolates	38
4.2	Illustrations of Gram-positive Organisms	40
4.3	Petri Dishes Illustrating Antibiotic Susceptibility Pattern of Various Isolates	44
4.4	Illustrations of Virulence Activity	47

## LIST OF TABLES

Tables	Title of Tables	Page
4.1	Total Bacterial Count of Fruit Samples	37
4.2	Gram Stain and Microscopy	39
4.3	Biochemical Characterization of Isolates from Watermelon and Pineapple Samples	41
4.4	Antibiotic Susceptibility Results of Gram-positive Isolates	43
4.5	Antibiotic Susceptibility Results of Gram-negative isolates	43
4.6	Virulence Factors Identified in Bacteria Isolates from Watermelon and Pineapple Samples	46

## ABSTRACT

Ready-to-eat (RTE) fruits are increasingly found in the markets as consumers demand fresh fruits on-the-go to meet up with a fast-paced lifestyle. Despite their advantages, the fruits are exposed to contamination due to the many processes they go through before they reach the consumer. This creates conditions for pathogens to establish themselves on the surface and within the pulp of fruits which may lead to illnesses on consumption. The aim of this study was to examine retailed RTE fruits in Ota for bacterial contaminants, highlight their antibiotic susceptibility patterns and detect selected virulence factors. RTE watermelons and pineapples were sampled from vendors along strategic locations in Ota, Ogun State. The fruits were analyzed using standard microbiological methods. Presumptive identification was by biochemical tests, Kirby-Bauer disc diffusion method was used to determine their resistance patterns against eight antibiotics. The isolates were screened for haemolytic activity, protease activity, and biofilm formation. Molecular characterization was carried out using polymerase chain reaction. The 16SrRNA gene of the isolates was amplified using the primer pair 27F- 5'- AGAGTTTGATCCTGGCT CAG -3', and 1492R 5'- GGTTACCTTGTTACGACTT -3'. to confirm isolates. The isolates were tested against eight antibiotics for their susceptibility and screened for haemolytic activity, protease activity, and biofilm formation. The isolates identified via Gram-staining and biochemical tests were *Bacillus*, *Listeria*, *Sarcina*, *Pseudomonas*, *Lactobacillus*, *Micrococcus*, *Staphylococcus*, and *Streptococcus* species. *Bacillus* sp. was detected in both pineapples and watermelons. The most active antibiotics with their susceptibility rates were Ofloxacin (88%), Gentamicin (77%), and Erythromycin (33%). A 100% resistance to Ceftazidime, Cefuroxime, Cloxacillin, Nitrofurantoin, and Cefixime was observed. *Staphylococcus* was resistant to all the antibiotics. The isolates possessed at least one virulence factor. Of the isolates, 38.9% were negative for biofilm formation, 50% were proteolytic, and 61.1% showed either beta or alpha haemolysis. Bacteria with diverse pathogenic factors are present in RTE fruits. It is recommended that actions which will reduce the bacterial load on RTE fruits are enforced.

Keywords: Bacterial pathogens, Watermelon, Pineapple, Antibiotic susceptibility, Virulence factors, Protease, Biofilm formation, Haemolysis